

A high-level monthly briefing on operations and activities at the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory – Home of Science and Engineering Solutions. Work at the lab supports the Department's business lines of environmental quality, energy resources, national security and science.

■ ENERGY RESOURCES – Idaho Technology Scrubs “Sour” Gas

With fossil fuel resources dwindling, INEEL researchers are making the most of what's available. The key, they say, is the development of materials capable of removing impurities that “sour” natural gas, making it unusable as a fuel. By adapting the polymer polyphosphazene with the addition of various chemical groups, the team creates substances with new properties – be they “glassy, runny, sticky, or gooey,” says chemist Fred Stewart. They then tinker with the material's physical characteristics to form durable membranes, maximizing their utility for fuel separation. Already, the team has created a membrane that passively removes carbon dioxide and hydrogen sulfide from natural gas, increasing the fuel's efficiency and value.

■ ENVIRONMENTAL QUALITY – Work Proceeds on Key Construction Project

Construction on the Glovebox Excavator Method (GEM) project at the INEEL's Radioactive Waste Management Complex (RWMC) that started in July, four months ahead of the milestone start date, is now approximately 50 percent complete. Construction is expected to be completed in mid-May, and will be followed by pre-operational testing and operational readiness activities. Excavation could begin as early as September 2003. The project has built a mockup facility, which is now being used to prepare for operations. The GEM project will demonstrate the ability to retrieve waste from the RWMC's Subsurface Disposal Area. Information gained from this activity will be used to help DOE and its regulators choose a final remedy for all of the buried waste at the Subsurface Disposal Area.

■ NATIONAL SECURITY – INEEL Expertise Shared at National Conference

Laurin Dodd, Associate Laboratory Director for National Security, spoke earlier this month at the Center for Subsurface Sensing and Imaging Systems' (CenSSIS) Research and Industrial Collaboration Conference. CenSSIS is a National Science Foundation Engineering Research Center, headquartered at Northeastern University in Boston, Mass. Dodd joined the director of Homeland Security for Raytheon and the technical vice president of the Analogic Corporation to discuss Homeland Security application problems such as luggage scanning, border and Customs crossings, harbor evaluations and detection of nuclear materials.

■ SCIENCE – New System Supports Structural Safety

A system designed and built at the INEEL reconstructs growing cracks in common structural materials, such as carbon and stainless steels. The technique, known as microtopography, promises to boost scientists' basic understanding of how common structural components break under the strain of accident overloads, such as earthquakes. INEEL researchers predict it will improve building design and analysis and bolster the safety of structures ranging from aircraft to waste storage tanks at DOE facilities. Developed by INEEL research engineer Randy Lloyd, the microtopography system uses the fracture surfaces of ductile materials – those that can be bent or stretched and that retain the new shape – as a road map to recreate the fracture process, starting from an initial defect and progressing to complete component failure.

For more information, contact Ron King at 208-526-7300